

What is claimed is :

1. A non-linear reproduction control method of a multimedia stream :  
comprising :

judging a skip direction by interpreting whether a skip request is a forward  
skip or a backward skip when the skip request is inputted from the user ;

determining a skip unit by judging whether the user request is a big unit or  
a small unit ;

selecting a structural information or semantic information alternation point  
of the multimedia stream mostly adjacent to the present reproduction position as a  
reproduction resuming point on the basis of the determined skip direction and skip  
unit ; and

resuming reproduction of the media from the selected point.

2. The non-linear reproduction control method of the multimedia  
stream according to claim 1, wherein the structural information in the selecting  
process for selecting the reproduction resuming point describes information about  
a shot or a scene existed in the multimedia stream on the basis of a time axis.

3. The non-linear reproduction control method of the multimedia  
stream according to claim 1, wherein the semantic information in the selecting  
process for selecting the reproduction resuming point describes information about  
appearance or disappearance of an object, state of the object, occurrence or  
termination of an event, and background change information on the basis of the  
time axis.

4. The non-linear reproduction control method of the multimedia stream according to claim 1, wherein the structural information or semantic information about the multimedia stream in the selecting process for selecting the reproduction resuming point is video index which is extracted automatically by a video indexing system, described by semi-automatic or manual process.

5. The non-linear reproduction control method of the multimedia stream according to claim 1, wherein the selecting process for selecting the reproduction resuming point by using the structural information or semantic information about the multimedia stream comprises the step of :

selecting a reproduction resuming point by considering the preset temporal offset with the skip direction, skip unit, the present reproduction point information.

6. The non-linear reproduction control method of the multimedia stream according to claim 5, wherein the selecting step for selecting the reproduction resuming point by considering the preset temporal offset with the skip direction, skip unit, the reproduction resuming point is selected as the point of the structural information or semantic information change point which is mostly adjacent to a point calculated by using the preset temporal offset and the present reproduction point .

7. The non-linear reproduction control method of the multimedia stream according to claim 5, wherein the selecting step for selecting the reproduction restart point by considering the set temporal offset with the structural

information or semantic information, skip direction, skip unit, comprising: If distance between the most adjacent structural or semantic information change point and the point calculated by using the preset temporal offset and the present reproduction point is larger than certain threshold, the reproduction resuming point is selected as the point calculated by using the preset temporal offset. Otherwise, the reproduction resume point is selected as the point is selected as the structural or semantic information change point which is the most adjacent to the point calculated by using the preset temporal offset and the present reproduction point.

8. The non-linear reproduction control method of the multimedia stream according to claim 1, wherein the selecting process for selecting the reproduction resuming point selects a shot unit as the skip unit in use of the structural information, and selects an alternation point of the semantic information mostly adjacent to the present position as a transferring point in use of the semantic information when a skip by the small unit is requested.

9. The non-linear reproduction control method of the multimedia stream according to claim 1, wherein the selecting process for selecting the reproduction resuming point selects a scene unit as the skip unit in use of the structural information, and selects an alternation point of the semantic information apart from the current reproduction position with predefined number of semantic information changes for big unit as a resuming point or an event change point or a background change point as a resuming position in use of the semantic information when a skip by the big unit is requested.

10. A non-linear reproduction control method of a multimedia stream :  
comprising :

inputting a forward or backward skip order from a user ;

5 selecting a reproduction resuming point by considering the present  
reproduction position, a skip direction, structural information or semantic  
information of the multimedia stream or preset temporal offset information ;

reproducing the media from the selected reproduction resuming point ;

10 displaying additional reproduction resuming candidate points using the  
structural or semantic information alternation point or point calculated by using a  
multiple of the temporal offset besides the reproduction restart point on a screen  
by using a key-frame or a key-region ; and

15 resuming reproduction by considering the selected point as a reproduction  
restart point when the user selects the key-frame or key-region displayed on the  
screen.

11. The non-linear reproduction control method of the multimedia  
stream according to claim 10, wherein the displaying process for displaying the  
additional reproduction resuming candidate points on the screen by using the key-  
20 frame or key-region displays only the big unit or small unit on the screen between  
the skip units or displays the big unit and small unit on the screen at the same time.

12. The non-linear reproduction control method of the multimedia  
stream according to claim 11, wherein a certain separator is displayed together on  
25 the screen in order to distinguish between the big unit and small unit when the big

unit and small unit are displayed on the screen at the same time.

13. The non-linear reproduction control method of the multimedia stream according to claim 11, wherein the big unit and small unit are displayed in temporal order without additional distinctions when the big unit and small unit are displayed on the screen at the same time.

14. The non-linear reproduction control method of the multimedia stream according to claim 10, wherein the key-frame or key-region displayed on the screen in the displaying process is disappeared after a certain time or by a request of the user.

15. A non-linear reproduction control apparatus of a multimedia stream, comprising :

a reproduction unit for reproducing the multimedia stream ;  
an input unit for transmitting a media file reproduction order inputted by a user to a main control unit,  
a media file constructed with multimedia stream data ;  
an index structure describing structural information or semantic information of the pertinent multimedia content ; and

the main control unit for controlling the media file reproduction in accordance with the order inputted from the input unit.

16. The non-linear reproduction control apparatus of the multimedia stream according to claim 15, wherein the input unit uses a method using a mouse

or a button, a gesture input method, and a voice order method etc.

17. The non-linear reproduction control apparatus of the multimedia stream according to claim 15, wherein the main controller comprises :

5 a control module for controlling reproduction of the multimedia stream with the input of the index structure and media file, and controlling reproduction of the whole multimedia stream by including a logic in order to perform judgement and control for reacting to a user request from the input unit; and

10 a non-volatile memory for storing an application program constructing a system, and storing fast forward/rewind speed for the user's request, preset time offset for forward or backward skip, and other user's preset parameter about media reproduction controls.

18. The non-linear reproduction control apparatus of the multimedia stream according to claim 15, wherein the media file and index structure is located 15 in the local region of the system or connected to the system using a wire/wireless network

19. The non-linear reproduction control apparatus of the multimedia stream according to claim 15, wherein different operations are permitted for the 20 input unit in order to request the forward or backward skip by the big unit/small unit by using the same button of the input unit.

20. The non-linear reproduction control apparatus of the multimedia stream according to claim 19, wherein the input unit recognizes the skip by the 25

small unit when the button is clicked once, or it recognizes the skip by the big unit when the button is double clicked, or it recognizes the skip by the big unit when the button is clicked once, or it recognizes the skip by the small unit when the button is double clicked.

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21. The non-linear reproduction control apparatus of the multimedia stream according to claim 19, wherein the input unit recognizes the skip by the small unit when the button is clicked shortly, or it recognizes the skip by the big unit when the button is clicked long, or it recognizes the skip by the big unit when the button is clicked shortly, or it recognizes the skip by the small unit when the button is clicked long.

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